

REMARKS

Claims 1-13 are canceled herein without prejudice or disclaimer. Claims 14-26 are added, and are thus all of the claims pending in the application. Claims 3, 4, 10 and 11 stand objected to on informalities. Claims 1-13 stand rejected upon informalities. Claims 1-13 stand rejected on prior art grounds. In addition, the drawings and specification are objected to. Applicants respectfully traverse these objections/rejections based on the following discussion.

I. The Objections to the Drawings

The drawings are objected to because, according to the Office Action, reference character “100” has been used to designate both of the weight computation steps in Figure 2. However, Applicants confused by this objection as Figure 2 clearly only shows reference character “100” being used to designate the decisional step corresponding to the class confidence value L_{jk} for audio being checked against its threshold a_t . Furthermore, reference numerals 110 and 120 are used to designate the steps corresponding to the two separate audio weight determinations. A duplicate copy of all the drawings, as originally filed, is being provided herewith to further show this. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this objection.

II. The Objections to the Specification

The specification is objected to because of informalities. The Office Action suggests that the Applicants re-format the specification to cure certain errors. Moreover, the Office Action indicates that the various variables “i”, “j”, and “k” are defined both as singular variables and

plural variables contrary to conventional practice, and as such the Office Action objects to these designations. As such, Applicants have redefined the several variables and have more clearly articulated the definitions of these variables. However, these redefinitions are within the scope of the original subject matter, and as such do not and should not constitute new matter. Clearly the Applicants have made these changes in an effort to properly define the variables in accordance with conventional practice, and to facilitate a proper understanding of the invention. Moreover, the entire specification has been reviewed for semantic and grammatical errors as well, with changes noted in the attached substitute specification. As such, Applicants respectfully request that the substitute specification be entered. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this objection.

III. The Objections to the Claims

Claims 3, 4, 10, and 11 are objected to because of informalities. As such, Applicants have canceled claims 1-13 and have replaced them with new claims 14-26 to overcome the informalities noted in the Office Action. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this objection.

IV. The 35 U.S.C. §112, Second Paragraph Rejections

Claims 1-13 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. As such, Applicants have canceled claims 1-13 and have replaced them with new claims 14-26 to overcome the informalities noted in the Office Action. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this objection.

V. The 35 U.S.C. §101 Rejections

Claims 1-13 stand rejected under 35 U.S.C. 101 because, according to the Office Action, the claimed invention lacks patentable practical application. Applicants respectfully traverse these rejections based on the following discussion. First, Applicants have canceled claims 1-13 and have replaced them with new claims 14-26. Second, the usefulness, the specification clearly articulates a useful and novel use of the invention as it relates to audiovisual speech recognition. More specifically, the Applicants refer to page 5 line 20 to page 8 line 3 of the specification as originally filed (and corresponding paragraphs in the substitute specification filed herewith) which fully, completely, and unequivocally describe improvement in phonetic classification achieved by practicing and implementing the invention in that context. Again, Applicants respectfully request a reexamination of the substitute specification in order to understand fully the usefulness of the claimed invention. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this objection.

VI. The Prior Art Rejections

Claims 1, 7, and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang et al. (U.S. Patent No. 6,539,353), hereinafter “Jiang”. Moreover, claims 2-6 and 9-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang in view of Liu (U.S. Patent No. 5,880,767). Applicants respectfully traverse these rejections based on the following discussion.

Jiang teaches a method and apparatus for speech recognition. The method and apparatus convert an analog speech signal into a digital signal and extract at least one feature from the

digital signal. A hypothesis word string that consists of sub-word units is identified from the extracted feature. For each identified word, a word confidence measure is determined based on weighted confidence measure scores for each sub-word unit in the word. The weighted confidence measure scores are created by applying different weights to confidence scores associated with different sub-words of the hypothesis word.

Liu teaches method and system for enhancing various types of images including photograph, CD, video, and graphic art images. The method of enhancing the input image, includes the steps of: filtering the input image to extract m different frequency components r_k ; adaptively sharpening the m different frequency components r_k , where the amount of sharpening for each component r_k corresponds to a sharpening function $g_k[r_k]$; and adding the adaptively sharpened m different frequency components $g_k[r_k]$ to the input image. Because the sharpening function is typically nonlinear, the step of determining the value of the adaptive frequency component corresponding to the sharpening function is achieved by mapping the filtered component by the corresponding sharpening function.

Applicants have canceled claims 1-13 and have added claims 14-26 herein. In view of the amended claims, neither Jiang nor Liu teaches, “[a] method for determining a manner of classifying a sample in one of a number of predetermined classes, said method comprising: computing a weight value for each of a plurality of classifiers, wherein said classifiers indicate a manner of classifying a sample in one of a number of predetermined classes; calculating for each of said predetermined classes a weighted summation across said classifiers of a likelihood that the sample belongs to a particular class, weighted by said weight value; and designating said sample as belonging to said class for which said weighted summation is greatest in value,” as provided by the newly added independent claim 14, and similarly claimed in newly added

independent claims 20 and 26.

Moreover, the claimed invention discloses a novel way of determining relative confidence of a classifier in a decision fusion experiment example. In addition, it has been disclosed that how this measure of confidence can be adapted for every given sample in the example. Conversely, Jiang discloses associating weights with classifiers and using a weighted summation of likelihoods to determine which class the sample belongs to, which is a very well practiced technique in decision fusion experiments. It should be noticed that the weights used by Jiang (the function $f_{\text{class}(U_i)}(x_i)$ in column 5, equation 1, line 60) are decided a priori and they are kept constant during the experiment. There is no technique mentioned as to how these weights can be determined during the experiment, which is one of the important contributions of the claimed invention. In fact, determining these weights during the experiment allows one the ability to adapt the weight from sample to sample in the experiment.

Similarly, Liu does not teach the invention, as Liu uses a filter for sharpening the image, which is a weighted sum of the ordered pixel values of the image. In fact, Liu is not related to the claimed invention, and decision fusion in general, as the image pixel values are something inherent to the input data while in a decision fusion experiment the order statistic is of the outcomes of the classifiers after their application on the data. Moreover, from just the input data (without any processing on it), no information can be extracted about the confidence of a classifier.

Conversely, in the claimed invention, the decision of the respective classifiers itself is being used to measure their confidence level. This is being done by measuring how well a classifier is able to discriminate the classes for a given sample. This discrimination is expressed as the L-statistic of the likelihoods for various classes given by the classifier. Since this

discrimination can be measured for each sample, it is possible to evaluate the confidence of a classifier adaptively during the experiment. In the very useful context of audiovisual speech recognition experiments performed in accordance with the invention, the claimed approach achieves much better results as compared to using static weights, as in Jiang, for audio and video.

Furthermore, a cumulative measure of the above mentioned discrimination among classes reflects the overall confidence of the classifier, which can form the static part of the classifier confidence during the experiment. Clearly, the approach provided by the claimed invention is absent from the cited prior art of record. Therefore, the claimed invention is patentably distinct over both Jiang and Liu.

Moreover, even if Jiang and Liu were legally combinable, and there is no indication as to a motivation for such a combination, then they would still fail to disclose the elements of the claimed invention for the reasons provided above. Thus, neither Jiang nor Liu whether taken alone, or in combination with one another teaches the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw these rejections.

VI. Formal Matters and Conclusion

With respect to the objections/rejections to the specifications and claims, the specification and claims have been amended, above, to overcome these objections/rejections. With respect to the objection to the drawings, the Applicants respectfully traverse the objections to the drawings, but nonetheless a Submission of New Formal Drawings is submitted herewith in order to provide a proper understanding of the invention. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections/rejections to the specification, claims and

drawings.

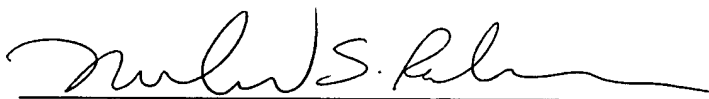
In view of the foregoing, Applicants submit that claims 14-26, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. Moreover, no new matter is being added. Only clarifications in response to the suggestions and requests in the Office Action are provided in the substitute specification provided herewith. As such, the Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

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